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Planning Applications Group

PATRICK PARSONS

40 St. Paul's Square
Birmingham
West Midlands
B3 1FQ

tel: 0121-592-0000

e-mail: mail@patrickparsons.co.uk

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| **Job No:** | B18075 | **Date:** | 18.05.21 |
| **Job Title:** | Whitecliffe | **Engineer:** | RDT |
| **Reference:** | TN05A Fastrack Tunnel Approach Drainage Statement | **Checked:** | DCT |
| **Location:** | Ebbsfleet, Kent | **Sheet No:** | 1 of 1 |

Background:

This Technical Note summarises the drainage strategy for the catchment draining to the culvert under the Fastrack carriageway, to support a Reserved Matters Planning Application for works to the tunnel serving Fastrack. The culvert links 2 swales running along the west edge of the Whitecliffe development. The swales serve much of phases 1 and 2 of the Ashmere village area of the development, and they eventually discharge to a large balancing lake to the south. The culvert passes beneath the Fastrack route on Fastrack's approach to the tunnel between the Whitecliffe development and Bluewater shopping centre.

This technical note should be read in conjunction with: -

- Whitecliffe Water Management Plan
- Drawing No. B18075/151 Whitecliffe Drainage Strategy Sheet 1
- Drawing No. B18075/153 Whitecliffe Drainage Strategy Sheet 3
- Drawing No. B18075/215 Fastrack Tunnel Approach Drainage Layout
- Drawing No. B18075/216 P2 Fastrack Tunnel Approach Culvert Details
- Drawing No. B18075/217 Fastrack Tunnel Approach Swale Details
- Fastrack Culvert Approach Surface Water Drainage Calculations Rev A

Surface Water Drainage Strategy:

The drainage proposals have been developed to comply with the approved Water Management Plan, and the associated site wide drainage strategy (see drawings nos. B18075/151 and 153).

Flood control

Development plots are designed to discharge unrestricted to the strategic drainage network of swales and sewers to an attenuation lake, from where surface water run off is pumped to a new outfall into the River Thames at a rate controlled by a surface water pumping station.

The swales and sewers forming the strategic drainage network, of which the culvert is part, have been sized such that there will be no flooding for a 1 in 30 year storm event, and any flooding occurring during a 1 in 100 year storm event plus a 20% allowance for climate change will be contained within carriageways below the top of kerb level, and channelled away from properties towards the lake or swales. A further check has been carried out on the effects of an extreme storm event to ensure flood routes avoid properties.

Infiltration techniques are not suitable on the site due to the low permeability of the soil and the presence of an underlying principal aquifer.

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The results of the simulations shown in the calculations demonstrate that the water level at the upstream end of the culvert (pipe no.1.008) reaches 7.769m AOD during the worst case 100 year storm + 20%, which gives a freeboard of 731mm to the finish ground level at the headwall (8.500m AOD), and for a 100 year storm + 40% the water level rises to 7.913m AOD reducing the freeboard to 587mm.

Following preliminary comments from the LLFA, it is now proposed for the invert of the culvert to be buried by 100mm to benefit invertebrates within the local wildlife corridor. This slightly reduces the capacity of the culvert but only increases the water level upstream of the culvert by 4mm for the 100 year + 20% storm, and 11mm for the 100 year + 40% storm.

Water quality:

The swales and lake which form part of the strategic drainage network are designed to act as a treatment train to treat the surface water run-off from the development to the standard required by the SUDS manual. This is achieved by using check dams and plant species that will slow the velocity of water sufficiently to allow the requisite treatment to be provided.

Further treatment will be provided to run-off reaching the lake with the use of recirculation mains which will take water from the lake and pump it to the top of the swales to provide additional treatment and a constant flow of water through the swales.